

What is claimed is:

1. A method for preparing a ring-formed body comprising the steps of:

forming, on a substrate, a column in a columnar form which
5 serves as a core of a ring-formed body;

depositing, on both the substrate and the column, a
ring-formed body forming film for forming the ring-formed body
so that the ring-formed body forming film formed on the
substrate and the ring-formed body forming film formed on the
10 column are separated from each other;

forming a mask film for covering the ring-formed body
forming film; and

subjecting the mask film and the ring-formed body forming
film to anisotropic processing so that the films remain on a
15 sidewall of the column, thereby forming a ring-formed body
comprised of the ring-formed body forming film having thereon
the mask film.

2. The method as cited in claim 1, wherein:

said ring-formed body forming film is formed by deposition
20 from a vertical direction relative to a surface of the
substrate.

3. The method as cited in claim 1, wherein:

said ring-formed body forming film is formed of a stacked
film including a plurality of thin films formed by deposition.

25 4. The method as cited in claim 1, wherein:

said column is formed so that the vertical cross-section
with respect to the surface of the substrate is in a trapezoid
form.

5. The method as cited in claim 1, wherein:

30 said column is formed of a nonmagnetic material.

6. The method as cited in claim 1, wherein said column is formed of:

a columnar formed conductive material; and

5 a nonmagnetic material film formed on the sidewall of said columnar formed conductive material.

7. The method as cited in claim 1, wherein the process for forming said column comprising the steps of:

forming an aperture on a mask film formed on a substrate;

filling inside of aperture with conductive material;

10 forming a columnar formed conductive material formed inside of the aperture by removing excess conductive material on the mask film and mask film;

forming an insulating film for covering said conductive material; and

15 forming a column in a columnar form made of said conductive material and the left insulating film by leaving the insulating film on the sidewall of the conductive material when removing excess part of the insulating film.

8. A magnetic memory device comprising:

20 a magnetic memory element which stores data utilizing spin momentum transfer switching and which is formed in a ring-form;

an electrode connected to a readout element for reading data stored in said magnetic memory element; and

25 a bit line extending along an upper portion of the electrode, wherein:

the magnetic memory element has a stacked structure comprising a magnetic layer, a nonmagnetic layer, and a magnetic layer, and is connected to both the electrode and the bit line.

30 9. The magnetic memory device as cited in claim 8, wherein:

said magnetic memory element comprises of a ring-formed stacked film; and

said stacked film includes a film formed by stacking a magnetic film, a nonmagnetic conductive film, and a magnetic
5 film.

10. The magnetic memory device as cited in claim 8, wherein:
said magnetic memory element comprises of a ring-formed stacked film; and

said stacked film includes a film formed by stacking a
10 magnetic film, a nonmagnetic insulating film, and a magnetic film.

11. A method of preparing a magnetic memory device comprising the steps of:

forming a bit line to be connected to a readout element
15 formed on a semiconductor substrate;

forming a ring-formed magnetic memory element connected to said electrode for storing information utilizing spin momentum transfer switching; and

forming a bit line to be connected to said ring-formed
20 magnetic memory element.

12. The method as cited in claim 11, wherein said process for forming said ring-formed magnetic memory element comprising the steps of:

forming, on said substrate, a column formed of a
25 nonmagnetic insulating material in a columnar form which serves as a core of a ring-formed body;

depositing, on both the electrode and the column, a ring-formed body forming film for forming the ring-formed body so that the ring-formed body forming film formed on the
30 electrode and the ring-formed body forming film formed on the

column are separated from each other;

forming a mask film for covering the ring-formed body forming film; and

5 subjecting the mask film and the ring-formed body forming film to anisotropic dry-etching so that the films remain on a sidewall of the column, thereby forming a ring-formed body comprised of the ring-formed body forming film having thereon the mask film.

13. The method as cited in claim 12, wherein:

10 a stacked film is formed as said ring-formed body forming film by stacking a magnetic film, nonmagnetic conductive film, and a magnetic film.

14. The method as cited in claim 12, wherein:

15 a stacked film is formed as said ring-formed body forming film by stacking a magnetic film, nonmagnetic insulating film, and a magnetic film.